IN THE CLAIMS

Please amend the claims as follows:

1. (Original) A multipin phantom for calibrating an imaging system, said phantom comprising:

a block for housing a plurality of pins; and

a plurality of pins placed in said block to enable computation of detector element positions of an imaging system.

2. (Original) The phantom of claim 1, wherein said block comprises foam.

3. (Original) The phantom of claim 1, wherein said plurality of pins are arranged in a circular configuration.

4. (Original) The phantom of claim 1, wherein said plurality of pins comprises metal pins.

5. (Original) The phantom of claim 1, wherein said plurality of pins are aligned along an axis oriented to extend parallel to a plane containing detector elements of said imaging system.

6. (Original) The phantom of claim 1, wherein said plurality of pins enable computation of a motion pattern for an energy source irradiating said detector elements.

7. (Original) A method for calibrating an imaging system having an array of detector elements arranged with respect to a reference position and having an energy source moving in a pattern to irradiate the array of detector elements, the method comprising:

initiating estimated detector positions for the array of detector elements and an estimated motion pattern for the energy source, said estimated detector positions and motion pattern being defined with respect to a reference position in the imaging system;

scanning a phantom having pins located at positions in the phantom;

calculating estimated pin positions for the pins in the phantom, with respect to the reference position, based on at least one of said estimated detector positions and motion pattern; and

modifying at least one of said estimated detector positions and motion pattern based on at least two of said estimated detector positions, motion pattern and pin positions.

8. (Original) The method of claim 7, further comprising determining an amount of error in at least one of said estimated detector positions, motion pattern and pin positions; and, when the amount of error exceeds a threshold, repeating said calculating and modifying steps.

9. (Original) The method of claim 7, further comprising:

repeating said calculating and modifying steps at least once to obtain first and second estimated detector positions, motion pattern and pin positions; and

calculating an amount of error between said first and second estimated detector positions, motion pattern and pin positions.

10. (Original) The method of claim 7, further comprising:

drawing rays between associated points along said estimated motion pattern of the energy source and said estimated detector positions; and

utilizing points of intersection between the rays to calculate said estimated pin positions.

11. (Original) The method of claim 7, further comprising:

determining actual pin positions from the scan of the phantom; and

calculating a difference between said estimated and actual pin positions.

12. (Original) The method of claim 7, further comprising:

determining actual pin positions;

calculating a pin error representing an amount by which said estimated pin positions differed from said actual pin positions; and

modifying said estimated detector positions based on the pin error.

13. (Original) The method of claim 7, further comprising:

determining actual pin positions;

calculating a pin error representing an amount by which said estimated pin positions differed from said actual pin positions; and

modifying said estimated motion pattern for the energy source based on the pin error.

14. (Currently Amended) The method of claim 7, wherein said motion pattern of the energy source ~~is defined in part by an energy beam radius~~ includes a radial component.

15. (Currently Amended) The method of claim 7, wherein said motion pattern of the energy source ~~is defined in part by an energy beam angle~~ includes an angular component.

16. (Original) The method of claim 7, wherein said modifying step further comprises computing an error vector $E = h * P$, wherein E represents an error associated with at least one of said estimated detector positions, motion pattern and pin positions, h denotes adjustments to produce more accurate estimated detector positions, motion pattern and pin positions and P represents a matrix of derivatives for detector-phantom pin samples with respect to said detector positions, motion pattern and pin positions.

17. (Original) The method of claim 7, wherein the phantom is positioned in the imaging system independent of the reference position.

18. (Original) A system for improved calibration of a diagnostic imaging system, said system comprising:

an array of detector elements arranged with respect to a reference position;

an energy source moving in a pattern to irradiate said array of detector elements;

a phantom having pins located at positions in said phantom; and

a reconstruction system calculating estimated pin positions for said pins in said phantom, with respect to said reference position, based on at least one of estimated detector positions and estimated motion pattern of said energy source, said reconstruction system modifying at least one of the estimated detector positions and motion pattern based on at least two of the estimated detector positions, motion pattern, and pin positions.

19. (Original) The system of claim 18, wherein said reconstruction system modifies at least one of the estimated detector positions and motion pattern by computing an error vector $E = h * P$, wherein E represents an error associated with at least one of the estimated detector positions, motion pattern and pin positions, h denotes adjustments to produce more accurate estimated detector positions, motion pattern and pin positions and P represents a matrix of derivatives for detector-phantom pin samples with respect to the detector positions, motion pattern and pin positions.

20. (Currently Amended) The system of claim 18, wherein the motion pattern of said energy source ~~is defined in part by an energy beam radius~~ includes a radial component.

21. (Currently Amended) The system of claim 18, wherein the motion pattern of said energy source ~~is defined in part by an energy beam angle~~ includes an angular component.

22. (Original) The system of claim 18, wherein said reconstruction system determines an amount of error in at least one of the estimated detector positions, motion pattern; and pin positions, and, when the amount of error exceeds a threshold, said reconstruction system repeats calculating and modifying at least one of estimated detector positions, motion pattern and pin positions.